



1. What is reverse osmosis?

Reverse osmosis, often referred to as RO, is an advanced water purification method that was initially developed by the U.S. Navy to produce drinking water from seawater for submarine crews. It is a membrane filtration technology that works by forcing water under pressure through the very tiny pores of a semi-permeable membrane. Modern reverse osmosis units for the home combine membrane technology with carbon and mechanical filtration to produce highly purified, great-tasting water.

2. How does it work?

In modern home units water, driven by normal city water pressure, flows first through a sediment pre-filter which removes any dirt and small particles that are in the water, next a carbon pre-filter, which removes organic contaminants including chlorine and its by-products. Then, it enters the reverse osmosis membrane, a very tight, sheet-like filter, which allows water to pass but rejects dissolved solids like sodium and impurities like lead and arsenic. Some of the water entering the unit is used to cleanse the membrane surface and flows to the kitchen drainpipes. The purified water is stored in a small storage tank until it is needed. When the faucet mounted on the sink is opened, the purified water is forced by air pressure through another carbon filter, which gives it a final polish and from there to the faucet. (This is a simplified description of a four-stage RO unit. -The simplified description omits a few very essential parts like flow control devices, check valves, and an automatic shutoff device that stops the inflow of water when the storage tank is full.)

3. What is the best RO system?

Essentially all RO membranes produce similar, highly purified water. However not all systems offer the same features. For example: The FMRO5-MT model is perfect for city water applications. This unit has five stages, meaning the water passes through a 5-micron sediment polypropylene prefilter, then two solid extruded carbon block cartridges for chlorine removal, then the RO membrane to remove the smallest of contaminants, and finally another carbon filter to polish the taste. The FMRO4G-ERP has water conservation in mind with a high efficient design. This

model produces more water in a shorter period of time, with less water going to the drain than a traditional 50 gpd RO. This is due to the non-electric permeate pump that utilizes the drain flow to reduce the backpressure from the storage tank allowing a more consistent working pressure across the membrane. The WQC4RO13 model is designed for the consumer that would like a low maintenance premium RO. This model is designed with a designer water-dispensing faucet, low profile polypropylene storage tank, and manifold filter heads that are able to pivot 180 degrees with built in shut off valves to make filter replacements as easy as a 1/4 twist of the filter to replace.

4. Is a reverse osmosis unit like a distiller?

Both effectively reduce "dissolved solids" content of water, but the processes are quite different. RO filters water through a very tight semi-permeable membrane. A distiller is like a big teakettle: it boils water, catches the steam, condenses it, and captures the resulting water. Most impurities are left behind in the boiling chamber. Both distillers and reverse osmosis systems rely heavily on carbon filtration for chemical removal. (Cheap distillers often have little or no carbon filtration and are, therefore, of limited effectiveness.)

5. But isn't distilled water purer than reverse osmosis water?

Distillers typically remove a few parts per million more of common mineral constituents like sodium. However, distillers don't do a good job with volatile chemicals with a low boiling point. Chloramines, for example, which many cities now use instead of chlorine as a disinfectant, aren't removed well by distillers. Reverse osmosis, with the carbon filters that accompany it, does a very good job with chloramines. Unless volatile chemicals like chlorine are removed by carbon filtration before they enter the distiller, they will be released into the room air or they will end up in the distilled water. But in general, distilled water is very pure, as is reverse osmosis water.

6. A friend told me reverse osmosis units waste a lot of water, is that true?

It depends on what you mean by waste. A home RO unit uses water to clean itself and wash away impurities. It's like a lot of other water-using appliances. We use water to wash clothes, to wash dishes, to wash cars, to flush toilets. A reverse osmosis unit uses more water in its operation than you actually consume, but it doesn't use enough that you'll notice it on your water bill. It uses water only while it's filling its storage tank. When the tank is full, the whole unit shuts down and no water runs to drain. It is typically like two or three extra toilet flushes a day.

7. What is the annual maintenance costs?

Only the prefilters and post filters need to be replaced at least on an annual basis to ensure proper performance. Ultimately the quality of the water and the amount of use will determine the frequency of filter changes. Depending on the point-of-use RO model, the annual cost is less than \$0.30 per day. The reverse osmosis membrane itself will normally last between two and five years.

8. What Is The Importance Of Water Pressure To An R.O. System?

It is the pressure of water that forces the water through the membrane for purification and flushes the rejected solids away. Low water pressure will result in reduced production and premature fouling of the membrane. The ideal pressure for operating an R.O. system is 60 PSI. Pressure below 40 PSI is generally considered insufficient, and should be boosted using a pressure booster pump.

9. Can I hook the reverse osmosis unit to my refrigerator/icemaker?

Yes, if you can reach it with a 1/4" tube from the under sink RO unit. Pressure is a consideration with some refrigerators, so it's a good idea to check with the manufacturer. The pressure you'll get from the RO unit is about 2/3 of the incoming line pressure.

10. How long will a reverse osmosis unit last?

Virtually forever if you service it regularly and replace parts that wear out, like the storage tank and the faucet. Typical membrane life is about 2 to 5 years, depending on the nature of the water that it's processing.

11. A filter salesman showed me a chart that said reverse osmosis doesn't remove chlorine. Is that true?

Technically what he said was true, but for practical purposes it's an out-and-out lie. It's true that the reverse osmosis membrane doesn't remove chlorine. It doesn't have to, because it has a couple of high quality carbon filters with it that do the job. In fact, if the first carbon filter didn't remove all the chlorine, the membrane would get eaten alive in no time.

12. The same salesman told me that reverse osmosis units remove minerals that are essential to health. Is that true or is he again twisting the truth?

It's true that RO units remove minerals about 95% of the mineral content anyway, but he isn't really telling you the whole story. The mineral issue is probably the

most controversial question in drinking water purification. Experts on both sides of the issue speak convincingly. Our own view, after reading much of the expert opinion, is that the mineral content of water either high or low, isn't nearly as important as they would have you believe. That is, minerals in water are inorganic and hard for your body to use. You get most of your minerals from food, which provides organic, easily assimilated minerals. The human body is a sophisticated instrument capable of adapting to a wide range of circumstances and capable of thriving in areas having water of high or low mineral content. As long as water is palatable, it's within the body's acceptable range. The main issue with water is chemicals, not minerals. Whether water contains 30 or 3 parts per million calcium isn't really significant, but the difference between 0.5 and 5 parts per million chloroform is of life or death importance.

13. Do reverse osmosis units need electricity?

No, they run on water pressure. You need electricity only if you add an electric pressure-boost pump or an ultraviolet lamp. Standard units have neither and normally don't need them.

14. Why are reverse osmosis units so popular?

Because they produce great-tasting, very pure water at a very reasonable cost (compared to buying bottled water) and in a trouble-free, fully automatic format. And the most frequent comment we get is: "I didn't think my water could taste this good, we drink so much more water than we used to."

15. Will A Water Softener Harm The Reverse Osmosis (R.O.)?

No. Calcium and magnesium (limescale) are two of the hardest minerals for the R.O. membrane to remove. Sodium (added to the water by the softener) is much easier on the membrane and it will reject 98% of all sodium in the water. A water softener will help extend the life of the membrane.